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Caries: Diagnostics And Treatment

Ahrorova Malika Shavkatovna

Samarkand State Medical Institute Assistant Of The Department Of Pediatric Dentistry, Uzbekistan

ABSTRACT

Caries is a process of destruction of hard tooth tissues, which occurs with the participation of cariogenic bacteria in the oral cavity (in the composition of dental plaque), as well as food residues processed by them. The organic acids produced by the bacteria gradually destroy first the enamel of the tooth and then the underlying dentin. As a result, a carious cavity is formed in the tooth, the walls of which are filled with soft decay of decaying dental tissues and a large number of cariogenic bacteria. The following article looks into the reasons leading to dental problems, its diagnostics and treatment methods.

KEYWORDS

Dental caries, cavity, diagnostics, hygiene, malnutrition, tooth tissue.

INTRODUCTION

Dental caries is a typical pathological process formed in the course of evolution as a response of the hard tissues of the tooth to various factors of influence, which gradually

lead to the formation of a dental defect in the form of a cavity. The causes of caries are reduced to two etiological factors:

Common factors:

The lack of a whole complex of vitamins and minerals leads to disorganization of the tooth structure. At the same time, a huge role is played by the pathological effect of easily digestible carbohydrates, the nature and mode of nutrition, as well as the fluoride content in drinking water. Somatic diseases directly related to the development and formation of the tooth and its elements, which can cause functional and structural changes.

The influence of damaging environmental factors that have an extreme impact on the microorganism (overheating, frostbite, etc.). Hereditary factors associated with the full formation of the structure and chemical composition of tooth tissues.

Local factors:

Dental plaque rich in microorganisms;

Exposure to the composition of the oral fluid, which can change as a result of various diseases;

The consistency of local protective mechanisms of tooth tissues, their resistance (stability).

The condition of the pulp is the connective tissue that fills the cavity of the teeth.

Normal laying and maturation of the dentition.

Deviations in the biochemical composition of tooth tissues.

Some sources distinguish the neurotrophic theory of the development of caries, the theory of protheliosis and chelation, Miller's theory, and Lukomsky's theory. These

theories are outdated and not relevant at the moment. Caries can occur at any age. Most often, it gradually appears in adults at 35-44 years old. Children are especially prone to caries, since the enamel of milk teeth is much more sensitive than the enamel of molars.

The reasons for the development of pathology in children

The reasons for the development of caries in children are the same as in adults, but caries in children develops rapidly. The reason for the rapid development is the demineralized immature enamel of children. Caries is usually white - it develops so quickly that it does not have time to stain with pigment. Due to immature dentin, if caries has moved beyond the enamel boundary, the child will certainly develop pulpitis.

Tooth decay symptoms

It is important to understand that the appearance of caries can be either an acutely ongoing process or a chronically developing one. In the first case, we are talking about a hereditary failure of the strength and stability of the tooth tissues. The chronic process arises as a result of prolonged exposure to local and general damaging factors. As a rule, the disease occurs gradually, since compensatory-adaptive mechanisms protect the body from unpleasant symptoms for a long time. However, at some point, they still fail, and the first signs of caries appear in the form of unpleasant sensations in the oral cavity when eating cold, hot, spicy, sour or sweet food. Further progression of the disease leads to the development of dental plaque and tartar, which worsen the condition of the oral cavity.

Another important symptom is the presence of carious spots, which are at first isolated, but gradually their number and area increases. The color of the tooth itself is not changed, with the exception of the affected area. With a slow course of the carious process, the affected area is colored yellow or dark brown. With the rapid course of caries, which is more often observed in children due to the increased permeability of the tissues of milk teeth and the individual reactivity of the body, the affected areas are light. The mucous membrane in the surrounding tissue of the tooth is not changed during caries, tapping on the tooth is painless.

Various carious spots

The clinic of carious lesions is also characterized by the occurrence of localized pain when exposed to an irritant, after the elimination of which the pain quickly subsides. This symptom occurs when tooth decay invades the dentin. [five]

Penetration of caries into dentin

Tooth caries pathogenesis

Currently in medicine there are a huge number of theories of the onset of caries. The generally accepted is a polyfactorial theory, according to which the demineralization of hard tooth tissues proceeds under the influence of microorganisms that accumulate in dental plaque. [5] The result of their vital activity leads to the formation of organic acids that destroy the protective elements of the dental tissue.

General diagnostic methods:

Examination and questioning of the patient. Despite its simplicity, it is of great importance and requires the care and knowledge of a

doctor. The dentist conducts an examination using a mirror, carefully examining each tooth for the presence of carious cavities and stains, as well as a changed tooth color. During the questioning, the dentist must find out what complaints the patient has made, learn about the presence of pain, under what conditions they arise and about their nature.

Percussion. Tapping allows the doctor to form an idea of the nature of pain, its irradiation and localization, as well as to identify compaction, granulomas, etc.

Probing. This diagnostic method is a more advanced examination method. It is performed using a special device - a probe, which allows the doctor to more accurately determine the degree of caries and its localization.

Thermal test. It belongs to the most accessible diagnostic methods, as it is carried out using a stream of cold water or cotton balls soaked in special solutions. The thermal test allows you to understand the degree of tooth pain and to check the stability of the dental tissue in response to a cold (most often) stimulus.

Additional diagnostic methods:

Electroodontometry. It represents the effect of electric current on the pulp of the tooth, it is needed to determine the state of the pulp (nerve endings) of the tooth. The advantages of this method are in determining the minimum current strength to which the pulp of the tooth reacts. Low values are characteristic for intact pulp, high - for damaged tissue with reduced sensitivity.

Vital staining. This method was proposed by E.V. Borovsky. It is carried out as follows: the tooth is pre-cleaned and dried, then a dye

(most often methylene blue) is applied to it, as a result of which carious spots and cavities are colored.

Transluminescence. The study is carried out in a dark room, the dye is previously applied to the teeth. Carious formations differ from healthy areas by the presence of dark spheres.

Luminescent method. It is based on the transmission of ultraviolet light through the dental tissue. At the same time, healthy teeth remain light, and those affected by caries become dark.

Determination of the electrical resistance of hard tissues. Due to the loss of mineral components, teeth affected by caries, when exposed to an electric current, have a lower electrical resistance compared to healthy teeth.

X-ray diagnostics. It is one of the earliest and simplest studies. It allows you to identify structural changes in the tooth tissues and hidden carious cavities.

Tooth caries treatment

Dental caries treatments include invasive and non-invasive procedures. Treatment methods for the initial and superficial stages of caries

Non-invasive methods are certainly easier for both the doctor and the patient. Their essence lies in the demineralization therapy of caries (restoration of the mineral balance). However, such treatment is possible only at the initial stages of caries development, when there are still no visible defects, and only the dynamic balance between the content of organic acids and the mineral component of the tooth is disturbed.

Non-invasive methods include treatment with various preparations of calcium, fluoride and other minerals. In practice, the most commonly used drugs are calcium gluconate, remodent, calcium glycerophosphate, calcium hydroxide, sodium fluoride, fluoride gel. The methods of their use are different: from rubbing in a fluoride gel to the introduction of calcium and fluoride preparations into the tooth tissues using electrophoresis. The course of remineralizing therapy consists of 15-20 procedures. Also, an important method of treatment is professional oral hygiene, which consists in cleaning hard-to-reach areas of the oral cavity from nutrient residues.

Medium and deep caries treatment methods

Invasive methods are used in cases where the process of caries formation extends into the deeper layers of the tooth tissues. There are no differences in treatment methods for medium and deep caries. In both cases, "preparation followed by filling" is used. This treatment pursues the following goals: removal of necrotic masses, imposition and fixation of a filling, restoration of the anatomical structure of the tooth. This process takes place in several stages:

Caries treatment with a drill

A standard caries treatment protocol includes the following steps:

Disclosure of a carious cavity using a spherical and fissure bur;

Expansion of the carious cavity to prevent secondary caries;

Necrotomy with subsequent removal of the destroyed and softened dentin;

Giving the carious cavity a geometric shape;

Preventive treatment of the edges of the enamel;

Antiseptic treatment of the cavity;

Filling using an adhesive protocol.

Caries treatment without a drill

The laser method is used very rarely - instead of mechanical treatment (with a drill), the affected tissues are removed with a laser beam. A standard caries treatment protocol is then followed.

The air-abrasive method is used for fluorosis. The carious cavity is treated with an air jet under high pressure.

The procedure is based on the treatment of the affected surface with ozone. However, there is no convincing evidence that applying ozone to the surface of decayed teeth stops or cures caries.

If caries is in the stain stage, then its development can be stopped with the modern ICON treatment method. Treatment involves the use of three components: acid, alcohol, and a special resin. If the carious lesion is located only within the enamel (there is no dentin lesion), then the microbial invasion between the prisms can be "etched away" and filled with resin, which is photo polymerized after application. The development of caries completely stops.

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